Hewlett-Packard VA 7100/7400 Microsoft[®] Cluster Services Installation Guide for HP Netservers



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1 Overview

General Information

This document provides procedures for setting up a Windows 2000 cluster on a Hewlett Packard VA series highavailability platform, based on Windows 2000 Advanced Server.

The HP Surestore Virtual Array 7100/7400 is a SPOFless (no single point of failure) high-availability cluster solution for shared disk storage. This cluster contains dual-path components, including redundant Fibre Channel host bus adapters installed in the server nodes, Fibre Channel hubs, and Fibre Channel controllers installed in the external storage array. These components provide the high-availability features of this configuration, supplementing the fail-over capabilities of Microsoft cluster software.

Document Description

with its content.

This document contains step-by-step procedures that detail all processes involved in installing a clustered solution using the Advanced Server edition of the Windows 2000 operating system. Included in the document is a listing of the required hardware configuration, with more detailed descriptions of the hardware contained in referenced resource material and support documents. Finally, all steps necessary for RAID configuration of the external Fibre Channel storage array using HP Surestore Command View SDM software are provided in this document. The purpose of this document is to cover all necessary steps of each setup process (whether contained within this document or referenced to an external document) for a Windows 2000 cluster in an active/passive configuration on an HP server connected to the VA 7100/7400 in a dual-path configuration.

CAUTION	To properly install, set up, and configure a cluster, it is critical that this procedure be followed exactly. Failure to do so could result in improper operation of the cluster, loss of critical data, improper fail-over of the cluster, or even require complete re-provisioning and rebuild of the entire cluster. Follow the exact sequence of the steps as written, and do not skip any steps.
NOTE	Before beginning the installation procedures, review each step of the document to become familiar

2 Pre-Installation Requirements

Introduction

This chapter provides a sequence of pre-installation checks and tasks to be performed before beginning installation of the VA 7100/7400 disk array in a dual-path cluster configuration. These checks and tasks include the following:

- Equipment supplied
- Applicable documents/reference material
- Hardware connections
- Local system configuration

Equipment Required

The following list identifies all HP hardware and software required to assemble and install the VA 7100/7400 disk array product in a Windows 2000 cluster configuration. Before beginning the installation, perform an inventory to ensure that all items on the list are available and ready for use.

NOTE	In the future, the components listed below will be supplied in kit form as part of the
	VA 7100/7400 Series Cluster kit

- Two HP servers, each with two NICs (four ports, total). HP server models currently certified are LH 6000, LT 6000r, and LXr 8500r.
- VA enclosure, containing two VA controllers
- CD containing the Surestore Command View SDM software and the associated Command View SDM Installation and User Manual
- Two HP D8602B Fibre Channel Host Bus Adapters (HBAs) per server.
- Two HP Fibre Channel hubs (Brocade A5667A or A5624A), or loop switches (HP P4459A).
- A dedicated Ethernet interconnect. This is the Ethernet controller that will be used for the crossover or heartbeat Ethernet cable.
- Gigabit interface connectors (GBICs). There should be ten GBICs, minimum. They will be inserted into each Fibre Channel interface connection, including both HBAs and hubs.
- Fibre Channel optical cables. There should be six fiber optic cables, minimum. They should be equal in length and color-coded. Do not mismatch color-coded (fiber cable type) cables.
- HP rail kits for each of the bundled hardware components and servers.
- Null modem cable

Applicable Documents/Reference Material

Included in the requirements to assemble and install the VA 7100/7400 disk array product in a Windows 2000 cluster configuration are three Hewlett Packard VA Series technical manuals and one VA configuration diagram. Before beginning the installation, perform an inventory to ensure that all documentation on the list below is available and ready for use.

NOTE	In the future, the documentation listed below will be supplied in kit form as part of the
	VA 7100/7400 Series cluster kit

- Hewlett-Packard Command View SDM Installation and User manual (supplied in both printed form and on Command View CD containing product software, refer to listing under Equipment Required). Also available in pdf format on HP SureStore Virtual Arrays 7100 /7400 User & Service Documentation website.
- Hewlett-Packard Secure Manager VA manual (available on Command View CD). Also available in pdf format on HP SureStore Virtual Arrays 7100 /7400 User & Service Documentation website.
- Hewlett-Packard AutoPath for Windows 2000 manual (available on Command View CD). Also available in pdf format on HP SureStore Virtual Arrays 7100 /7400 User & Service Documentation website.
- Hewlett-Packard VA Configuration poster (HP part/drawing number A5183-96130). Supplied with equipment and reference documentation.

The manuals provide instructions for interconnection of all components and interfaces, installation of software like Microsoft Cluster Server, and verification of proper installation and configuration of the cluster. The configuration poster has a detailed diagram that shows the entire VA layout, including all interfaces, connections, and descriptions.

NOTE Use the manuals and configuration poster as additional guides and information. Do not use the configuration poster and its instructions as replacements for the procedures of this document.

Hardware Connections

For cluster hardware interconnection, proceed as follows:

CAUTION Use of hardware not certified or approved by HP, unless specifically indicated in this procedure, may result in the improper operation of any or all components comprising the cluster. Different hardware, such as the FCAL or SCSI RAID controllers, HBAs, storage hubs, fabric switches, Fibre Channel GBICs, fiber optic cabling (short-wave or long-wave, distinguished by color coding), or server models may require additional configuration procedures, not contained in this document. Refer to the manuals and configuration poster described in the preceding paragraph for detailed information associated with the installation and configuration of vendor-specific hardware and/or software.

1. Disconnect the back-end and VPN (if applicable) network interfaces until after the cluster has been completely installed. They may be reconnected and configured later, but not until the procedures of this document have been completed.

CAUTION The storage array should be powered up before either server node is powered up. Also, power down both server nodes before the storage array is powered down.

2. For detailed hardware installation instructions, schematic diagrams, and component nomenclature, refer to the Command View SDM Installation and User manual, Secure Manager VA manual, AutoPath for Windows 2000 manual, and the VA Configuration poster described in the preceding paragraph.

CAUTION	It is critical that both server nodes be set up exactly the same; that is, identical components should
	be used and installed in identical locations on both nodes.

- Following the directions in the Command View SDM Installation and User manual, Secure Manager VA manual, and AutoPath for Windows 2000 manual, set up the VA external storage array, Fibre Channel storage hub or switch, GBIC interface converters, and the cables for each node.
- 4. Using the VA Configuration poster, attach the servers to the storage hub.

Local System Configuration

The remainder of this procedure assumes that both HP Netservers have been configured with Microsoft Windows 2000 Advanced Server operating system and the latest service packs. For more information about installing Microsoft Windows 2000 software on HP Netservers, refer to the HP information library on the website

http://www.hp.com/netserver

3 Configuring the Virtual Array

Introduction

This chapter contains detailed instructions for setup and configuration of the virtual array.

Preliminary Operations

The following preliminary operations must be successfully completed before beginning the Virtual Array Setup and Configuration Procedure.

- 1. Ensure that all requirements detailed in chapter 2 have been thoroughly reviewed and successfully completed.
- 2. Storage array is powered up.
- 3. Node 1 (primary node) is powered up and running.
- 4. Verify that all network cables and fiber cables are connected correctly and securely. The HBAs should display a flashing green light and a constant orange light. The orange light indicates that a link has been established.
- 5. The CD included in the VA equipment shipment should contain Surestore Command View SDM software. Refer to the Equipment Required paragraph of chapter 2. This CD contains all required management software.
- 6. If applicable, the local RAID disk arrays on both nodes and external storage array must be configured identically. For example, use the same driver letters and labels for local hard drives, CD-ROMs, and drives on the external disk storage array. Otherwise, the cluster will not function after fail-over from active node to passive node. Refer to the Hardware Connections paragraph of chapter 2.
- 7. If applicable, ensure that the Backend and VPN network interfaces are disconnected. They can be reconnected at the completion of this procedure. Refer to the Hardware Connections paragraph of chapter 2.

CAUTION	The storage array should be powered up before either server node is powered up. Also, power down both server nodes before the storage array is powered down.
NOTE	Ensure that the latest version of the HP Surestore Command View SDM software is being used. Refer to the Equipment Required and Applicable Documents/Reference Material paragraphs of chapter 2.

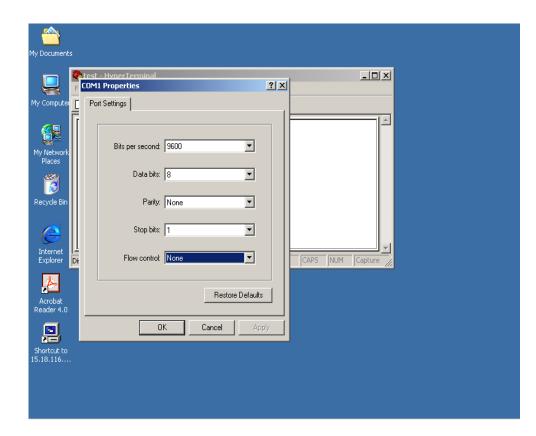
Virtual Array Setup and Configuration Procedure

To perform the virtual array setup and configuration process, proceed as follows:

Command View SDM Software Installation

- 1. Connect a null modem cable to one of the controllers in the VA. As shown below, the settings are as follows:
 - o Bits per second: 9600
 - o Data bits: 8
 - o Parity: None
 - o Stop bits: 1
 - o Flow control: None

Then, click OK.



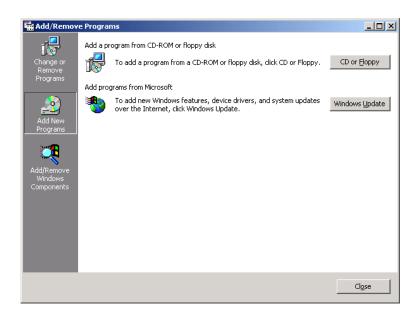
2. Referring to the window shown below, type **vfpfmt** at the Ready prompt, then strike the **Enter** key on the keyboard. At the following (yes/no): prompt, type **yes**, then strike the **Enter** key on the keyboard.

My Documents	🍓 u65s - HyperTermin	al					
	File Edit View Call T						
	02 23 0	3					
My Computer	Ready > Ready >						
My Network Places	Ready > vfpfmt Format Array. Clear	ALL data? (ye	s∕no);yes				
Internet	Connected 0:01:01	Auto detect	9600 8-N-1	SCROLL	CAPS NUM	Capture	
Explorer Acrobat Reader 4.0 Shortcut to 15.18.116		nuu uerett	2000 01111	Jackou	Jours Huga	Judpicure //	

 Insert the CD containing the HP Surestore Command View SDM software in the CD-ROM drive. On the Windows 2000 desktop, click the desktop Start -> Settings -> Control Panel to obtain the Control Panel window, as shown below. In the Control Panel window shown below, click Add/Remove Programs.

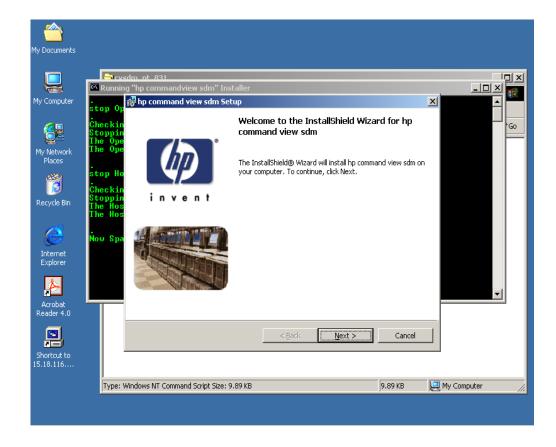
<u>Eile E</u> dit	View Favor	ites <u>T</u> ools <u>H</u>	lelp					1
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<u>&</u>	*	*	1	B	2	- AL	A	
Accessibility	Add/Remove Hardware	Add/Remove		Date/Time	Display	Folder Options	Fonts	
Options	Hardware		s and removes	programs and	Windows compo	nents		
2	i		e#***	Ø	P		ų	
Game Controllers	Internet Options	Keyboard	Licensing	Mouse	Network and Dial-up Co	Phone and Modem	Power Options	
S	3	a	٦		ļ			
Printers	Regional Options	Scanners and Cameras	Scheduled Tasks	Sounds and Multimedia	System			

4. On the Add/Remove Programs window shown below, select the Add New Programs icon, then choose the CD or Floppy option.



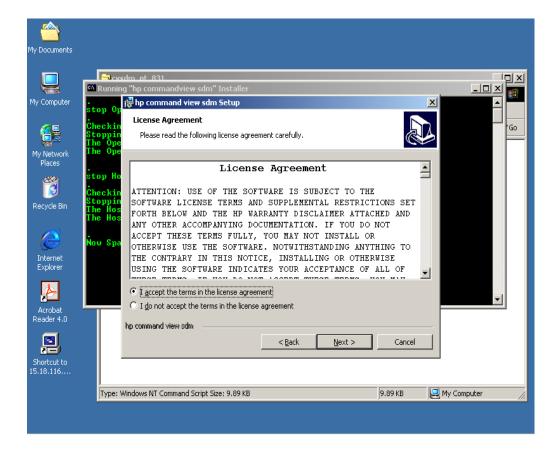
My Documents		
	🔁 cvsdm_nt_831	<u>- 0 ×</u>
My Computer	File Edit View Favorites Tools Help	19
my compater	🔄 🗢 Back 🔹 🤿 🐔 🔯 Search 🖓 Folders 🕉 History 🖓 🎇 💥 🖄 🧱 🕶	
	Address cvsdm_nt_831	▼ ∂Go
My Network Places		
	CV HA Runinst	
Recycle Bin	RunInst Windows NT Command Script	
Ø	Modified: 1/30/2001 8:37 AM	
Internet	Size: 9.89 KB	
Explorer	Attributes: Read-only	
<u></u>		
Acrobat Reader 4.0		
Shortcut to		
15.18.116		
	Type: Windows NT Command Script Size: 9.89 KB 9.89 KB	🖳 My Computer 🏼 🎵

5. On the Command View CD window shown below, click RunInst.



6. On the InstallShield Wizard for hp command view sdm window shown below, click Next.

7. On the License Agreement window shown below, click the I accept the terms in the license agreement button, then click Next.

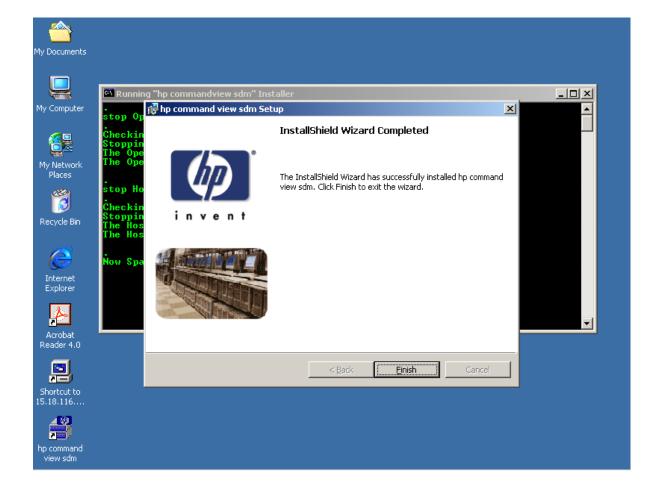


8. On the **Minimum Requirements** window shown below, verify that the six settings are checked as shown. Then, click **Next**.

My Documents		
	Srvsdm nt 831	민지
	Running "hp commandview sdm" Installer	
My Computer	stop Op	
	Checkin Stoppin The Ope software to run properly: Minimum Requirements:	Go
My Network Places	The Ope	
1 ALCOS	stop Ho 🗹 Windows 2000	
Recycle Bin	Stoppin 🗸 128 Megabyte RAM	
	The Hos Vicessor Speed 350 MHz or better	
	Nov Spa	
Internet Explorer	Video support at 64k colors or better	
<u></u>	Note: Requirements shown without a checkmark are not currently met on this system. You must have Administrators privileges and you must have either Windows NT 4.0 (SP 5) or Windows 2000 installed on this system before you can proceed. (The lower four	
Acrobat Reader 4.0	requirements in the list are to ensure a proper level of performance.)	
a	hp command view sdm	
Shortcut to 15.18.116		
	Type: Windows NT Command Script Size: 9.89 KB 9.89 KB 9.89 KB	puter //

9. The **Installing hp command view sdm** window as shown below appears and begins the software installation. It may require several minutes to complete the installation, however. Observe the Status bar in the displayed window. When the software installation is complete, click **Next**.

	🔍 Runnin	g "hp comm	andview sdm" Installer	
mputer	stop Op	🙀 hp comm	and view sdm Setup	
<u>_</u>	Checkin Stoppin	-	h p command view sdm yram features you selected are being installed.	
etwork	The Ope The Ope	ine prog		-
tes	stop Ho	P	Please wait while the InstallShield Wizard installs hp command view sdm. This may take several minutes.	
3	Checkin		Status:	
le Bin	Stoppin The Hos The Hos			
2	Now Spa			
rnet orer				
bat				-
oac er 4.0		hp command s	viau offe	
ļ		np commana i	<back next=""> Cancel</back>	
ut to 116	-			_

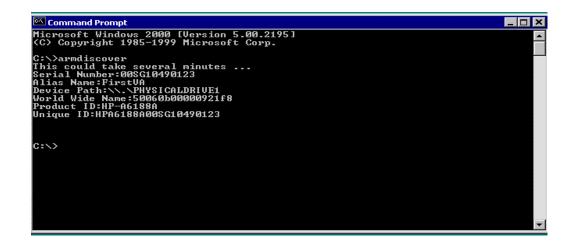


10. On the InstallShield Wizard Completed window shown below, click Finish.

11. The Starting HostAgent window shown below appears, and remains for a few minutes.

<u></u>		
My Documents		
	Starting HostAgent	
My Computer	Stopping OpenDial The OpenDial service is stopping The OpenDial service could not be stopped.	
	stop Hostagent ************************************	
My Network Places	Checking for HostAgent Stopping HostAgent The HostAgent service is stopping. The HostAgent service was stopped successfully.	
Recycle Bin	Now Spawning "hp commandview sdm" Installer start Hostagent ************************************	
Internet Explorer	Starting HostAgent The HostAgent service is starting The HostAgent service was started successfully.	
Acrobat Reader 4.0	Allowing 1 minute for HostAgent startup to complete	-
Shortcut to		
15.18.116		
hp command view sdm		

12. The **Command Prompt** window appears as shown below. The term **armdiscover** appears at the first C-prompt of the window display, followed by a set of device (**First VA**) characteristics, as shown.



- 4y Documents 🛋 "hp commandview sdm" installation succeeded * Allowing 1 minute for HostAgent startup to complete.... 68 tart OpenDial ********** tarting OpenDial... he OpenDial service is starting. he OpenDial service was started successfully. My Networl Places 8 tart armdiscover ******************************* tarting armdiscover... This may take a few minutes, please be patient... 'java.exe' is not recognized as an internal or external command, operable program or batch file. 'java.exe' is not recognized as an internal or external command, operable program or batch file. 'perable program or batch file. e Internet Explorer 'hp commandview sdm" install completed 4 Acrobat Reader 4.0 Shortcut to 15.18.116... <u> (</u> hp command view sdm
- 13. On the desktop display shown below, click the hp command view sdm icon.

14. The **hp command view sdm launcher** window appears, as shown below. This window shows the devices (and their characteristics) that the Command View SDM software has found. Click the **FirstVA** icon on the display.



15. The **hp command view sdm** window appears. If necessary, click the **Identity** tab to obtain the VA identity display as shown below. Then, click the **LUN Management** tab.



- 16. The display of the **hp command view sdm** window under the **LUN Management** tab appears. Use the display as shown below to create the following LUNs, as required:
 - a. Create a LUN 0 to be a 10-MB partition (this LUN will not be managed by the cluster).

NOTE The VA needs LUN 0 so that Microsoft Cluster can see LUNs over number 7

- b. Create the desired (user-definable) quorum LUNs.
- c. Create the desired (user-definable) data LUNs.

hp command view	sdm						
-						Refresh	
Cassini Higi Identity	h-end Controller - Exc Status	aliber	Configuration	Diagnostics	Download	Performance	
Logical LUNs	Business Copy						
LUN ID		Capacity			Size (GB)	<u>C</u> reate	
1 0%					0.500	Permissions	
2				0%	100.000	<u>D</u> elete	
1		Available Storage	468.246 GB				
		,					
	Status: Rea Cassini Hig Identity Logical LUNs LUN ID 0 0%	Cassini High-end Controller - Exc Identity Status Logical LUNS Business Copy LUN ID 0 0% 1 0%	Status: Ready Cassini High-end Controller - Excaliber Identity Status LUN Management LOgical LUNs Business Copy LUN D Capacity 0 00% 1 00% 2	Status: Ready Cassini High-end Controller - Excaliber Identity Status LUN Management Configuration Logical LUNs Business Copy Capacity 0 0% 1 0% 1 0% 1 0% 1 0% 1 0% 1 0% 1 0% 1 0% 1 1 0% 1 0% 1 0% 1 0% 1 1 0% 1 1 0% 1	Status: Ready Cassini High-end Controller - Excaliber Identity Status LUN Management Configuration Diagnostics LUN D Capacity 0 10% 2 0 0%	Status: Ready Cassini High-end Controller - Excellber Identity Status LUN Management Configuration Diagnostics Download Logical LUNs Business Copy LUN D Capacity Size (GB) 0.010 0 0% 0.010 0.500 2 0% 100.000 1	Status: Ready Cassini High-end Controller - Excaliber Entresh Performance Identity Status LUN Management Configuration Diagnostics Download Performance Logical LUNs Business Copy Capacity Size (GB) Create Oreate 0 0% 0.010 0.500 Permissions 2 0% 100.000 Delete

AutoPath Setup

To set up AutoPath for Windows 2000, proceed as follows:

- 1. Ensure that AutoPath for Windows 2000 software has been installed. Refer to the Hardware Connections and Applicable Documents/Reference Material paragraphs of chapter 2.
- 2. On the desktop display, click the **Start HP Auto Path Server/Client** icon. The **HP AutoPath Adapters** window appears, as shown below. Verify that the Fibre Channel host adapters are listed under Adapter # and Adapter Name. Then, click **Devices**.

P Auto Path View Help					
HP Auto	o Path Control Panel		Server Na	ame localhost	
evices	Adapters Adapter Name	Adapter State	# of Paths	Adapter SCSI Port #	
	Integrated HP NetRAID Aglient HHBA-510x PCI Fibre Channel Controller Aglient HHBA-510x PCI Fibre Channel Controller	Active Active Active	0 3 3	4 5 6	

3. The **HP** AutoPath - Devices window appears, as shown below. Verify that those VA LUNs that have been configured are listed under Device # and Device Name. Then, click on one of the devices listed.

	Path · Help	- Devices							
HP .	Auto	Path Cont	rol Panel			()	Server Name Disk Array	localhost	
Devices	;	Adapters				invent			
Devices Device#		Adapters		Serial#	State	# of Paths	Load Balance Policy	Preferred Path #	
	Dev HP	rice Name A6189A	EX22	004N50G008000	State Active	# of Paths 2	No Load Balancing	Preferred Path #	
	Dev	rice Name			State Active Active	# of Paths			

4. Click on **Device Settings** and observe that the **Device Settings** window for the selected LUN is displayed as shown below. On the display below, use the pull-down menu to select the desired **Load Balancing Policy**.

Server Name:	node2clstr1	Device Serial#:	0041	150G008000	00000090	Load Balancing Poli	-	Shortest Queue ServiceTin
)isk Array Unit:	00USP100111:	Device Name:	ΗP	A6189A	EX22	Preferred Path Num	ber:	No Load Balancing DefaultBalancePolicy Round Robin Shortest Queue Requests Shortest Queue Bytes
Path Number		State			Controller	Port#		Shortest Queue ServiceTim
		Active			1000		5.0.0	.2
		Active					6.0.0	

- 5. Repeat steps 3 and 4 for each LUN that has been configured.
- 6. AutoPath configuration is now complete.

Secure Manager Setup

To set up Secure Manager for Windows 2000, proceed as follows:

1. Ensure that Secure Manager for Windows 2000 software has been installed. Refer to the Hardware Connections and Applicable Documents/Reference Material paragraphs of chapter 2.

NOTE Secure Manager is not required if this cluster is the only host communicating with the virtual array. If there are other hosts or clusters in the system, Secure Manager is required.

- 2. To enable Secure Manager, proceed as follows:
 - a. Open a DOS window, and type the following:

```
armfeature -a -f LUN_SECURITY_xxGB -k <LicenseKey> <SerialNUMBER>
```

b. To ensure that the Secure Manager feature has been installed, type the following:

```
Armfeature -r <serialnumber>
```

Create Permission File

An ASCII permission file for the disk array to read must be created. Permission file structure and definitions are detailed in the following steps:

1. The listing below is an example of a Permission file.

NODEWWN	50060b0000203cb	1	CW	
NODEWWN	50060b00000203cb	0	CW	
NODEWWN	50060b00000202f1	1	CW	
NODEWWN	50060b00000202f1	0	CW	
NODEWWN	50060b000002076d	0	0	
NODEWWN	50060b000002076d	1	0	
NODEWWN	50060b000002120b	0	0	
NODEWWN	50060b000002120b	1	0	

- 2. In the listing of step 1 above, the indicator NODEWWN specifies the host adapter. The 16-character number that follows is the World Wide node address
- 3. The first number after the node address (0 or 1, in this case) identifies the specific LUN to which permissions are being granted.
- 4. The final character set of each entry is the indicator for type(s) of permissions. Types of permissions are:
 - o C Configure
 - o W Write
 - o R Read
 - o 0 None
- 5. As shown in the listing of step 1, permissions (CW) have been granted to LUNs 0 and 1 of four host adapter nodes, and no permissions (0) have been granted the other four host adapter nodes. The cluster host bus adapters get full access to LUNs 0 and 1, and the other host bus adapters get none.

Load Permission File

To load the permission file, proceed as follows:

1. Open a DOS window, and type the following:

```
armsecure -w -c -f c:\temp\mysecure -p <password> <serialnumber>
```

```
where
-w is for write
-c is for clear
-f is for the file
-p is for the password
```

- 2. The disk array responds with a message indicating that the array has updated the security.
- 3. Type the following:

armsecure -e -p <password> <serialnumber>

4. Secure Manager is now enabled.

Identifying World-Wide Node Names

The simplest method to identify world-wide node names is to use the Brocade switches (refer to the Equipment Required listing in chapter 2).

1. Open a browser, and enter the IP address of the Brocade switch in the disk array system.

NOTE There may be two Brocade switches in the disk array system. In that case, enter the IP address of each Brocade switch in the system.

2. Click on the **Name Server Table** tab of the display as shown below, and observe the world-wide node name (circled) for each node.

Auto Refresh Auto-Refresh Interval 15 Seconds Refresh	
Domain # Port # Port ID Port Type Port WWN Node WWN Symb	olic Name
1 0 011000 N 50:06:0b:00:02:07:6c 50:06:0b:00:02:07:6d NULL	
1 1 011100 N 50:06:0b:00:09:99:42 50:06:0b:00:00:09:72:82 [28] "H	P A6189A EX2
1 3 011300 N 50:06:0b:00:02:03:60 50:06:0b:00:02:03:61 NULL	
1 5 011500 N 50:06:0b:00:00:02:06:8c 50:06:0b:00:00:02:06:8d NULL	
1 6 011600 N 50:06:0b:00:02:12:0a 50:06:0b:00:02:12:0b NULL	
1 7 011700 N 50:06:0b:00:00:09:99:4e 50:06:0b:00:00:09:72:69 [28] "H	P A6189A EX3
	- A0189A E.

3. The Virtual Array Setup and Configuration Process is now complete. Proceed to Create the Cluster Service Domain Account, Service Group, and OU Group Policy of chapter 4.

4 Create the Cluster Service Domain Account, Service Group, OU Group Policy

Introduction

This procedure of this chapter should be performed by a Network Administrator, familiar with Windows 2000 Group Policies and Security.

General Information

The cluster service on each cluster node will run under the security context of a domain user account. This account must be created in the customer organizational unit (OU) and named OUName clusteradmin. In addition, a new user group called OUName Cluster Group must be created in the customer OU (ensure that the Group Scope is set to **Global** and the Group Type is set to **Security**). This user account must have the following local rights on each cluster node:

- Act as part of the operating system
- Back up files and directories
- Increase quotas
- Increase scheduling priority
- Load and unload device drivers
- · Lock pages in memory
- Log on as a service
- Restore files and directories

These local rights will be implemented via a Group Policy created later in this chapter.

NOTE Ensure that the customer OU already exists. It should have been created when the first server for the customer site was provisioned. Do not manually create the OU.

The domain user account (OUName clusteradmin) to be created can also be used for the SQL server service and SQL server agent service in the SQL server cluster environment (unless the Local System account is used instead). The new user group (OUName Cluster Group) to be created is a global security group and will initially have only one member, the domain user account OUName clusteradmin. The global security group, however, is a container designed to hold additional cluster user accounts. If the customer installs additional clusters into their architecture, this group will already have the appropriate user rights set by a Cluster GPO, and no additional security changes will be required. This group (OUName Cluster Group) must also be made a member of the **Service Accounts** universal security group located in the user container for the domain.

Preliminary Operations

Ensure that all requirements detailed in chapters 2 and 3 have been thoroughly reviewed and successfully completed before proceeding to the Account/Group Creation Procedure.

Account/Group Creation Procedure

To create the domain user account and the new user (global security) cluster group, proceed as follows:

- 1. Log in to a machine that belongs to the domain where the cluster is being installed, or log in to the domain controller itself. Go to **Start**, **Programs**, **Administrative Tools**, then click **Active Directory Users and Computers**. Ensure that the domain that appears is the correct one; if not, right-click on **Active Directory Users and Computers**, and click **Connect to Domain**. Enter the domain that the cluster is in, and click **OK**.
- 2. Locate the customer OU. In this procedure, the customer OU name is Genuity.

```
NOTE The OUName associated with the accounts and groups of this chapter should be abbreviated as necessary to ensure that its length does not exceed the maximum numbers of characters allowed. The OUName is user-definable, but is designated Genuity in the examples of steps 3 through 14 of this procedure.
```

- 3. Right-click the customer OU (*Genuity*), and click **Create New**. Select **User**. Name the new user account clusteradmin
 - (Genuity clusteradmin). Select the Password never expires option and User cannot change password options.
- 4. To create the cluster group, right-click the OU (*Genuity*), and click Create New. Select Group. Ensure that the Group Scope Global and Group Type Security radio buttons are selected. Name the new group Cluster Group (*Genuity* Cluster Group).
- 5. As shown below, the **clusteradmin** account and the **Cluster Group** are highlighted in the display pane in blue. The actual cluster group created will also have the customer OUName associated with the cluster group; in this example, *Genuity* Cluster Group.

🚡 Console1 - [Console Root\Active Directory Us	ers and Computers [eh	072c1850.NTENG.NC 💶 🗖 🗙
Console Window Help) D 🗳 🖬 💷 💷 🗵
Action View Eavorites ← → € ा	🗙 🗟 😰] 🦉 🕻	🛿 🖄 🖓 🍕 ն
Tree Favorites	Name	Type Descripti
Console Root	Е ВН100	Computer
Active Directory Users and Computers [eh07	📕 ЕН098С1850	Computer
TENG.NCS.BBNPLANET.com	BEH104C6400	Computer
ABCCorp	BEH105C6400	Computer
🗄 🧭 🎯 AriTest	EFAB2K	Computer
🖶 📲 Builtin	Genuity	Security Group Genuity
🕀 🔯 Commerce Server	🕵 Genuity_c1	User
E Computers	🕵 Genuity_c2	User
Domain Controllers	🕵 Genuity_c3	User
		Computer
⊕	🕵 clusteradmin	User
⊕	🕵 Cluster Group	Security Group
ForeignSecurityPrincipals Genuity		

6. After the account has been created and made a member of the cluster group, ensure that it is not a member of any other group. Right-click the user account, go to **Properties**, then the **Members of** tab. Click **Add**, and add the account to the group just created called **Cluster Group** (*Genuity* Cluster Group). As shown below, click on **Cluster Group** to highlight it, and then click **Set Primary Group**. Membership in all other groups can now be removed.

General Address	I Terminal Services Profile
deneral Address	Account Profile Telephones Organization
Member Of	Dial-in Environment Sessions
Member of:	
Name	Active Directory Folder
Cluster Group	NTENG.NCS.BBNPLANET.com/Genuity
Domain Users	NTENG NCS BBNPLANET.com/Users
Domain Osers	NTENG, NC3, DDNFLANET, COM/OSEIS
	NTENG.NCS.DONFDANET.COm/osets
Add <u>B</u>	lemove
A <u>d</u> d	

7. Highlight all group(s) that the account is a member of except **Cluster Group** (*Genuity* Cluster Group), and click to remove those group names. Then, select **OK**. This should leave only the newly-created **Cluster Group** (*Genuity* Cluster Group), as shown below.

Remote contr	ol	Te	erminal Services	Profile
General Address Member Of	Account Dial-in	 100 500 	Telephones	Organization Sessions
Member of:				
Name	Active Direc	tory Folder		
Cluster Group	NTENG NC	S.BBNPL4	NET.com/Genu	liity
Add	<u>R</u> emove			
Primary group: C	luster Group			
Set Primary Group	I here is		change Primary	y group unless iIX-compliant

- **NOTE** The following step places the newly-created **Cluster Group** (*Genuity* Cluster Group) into the domain-level group called **Service Accounts**.
- 8. In the customer OU (*Genuity*), right-click **Cluster Group** (*Genuity* Cluster Group), and select **Properties**. Then, click the **Members of** tab. Click **Add**, and select **Service Accounts**. Ensure that the **Service Accounts** group is associated with the hosting domain folder (**NTENG.NCS.BBNPLANET.com/Users**), as shown below. (In the example below, the hosting domain designation is **NTENG.NCS**, and the hosting domain zone is **BBNPLANET.com**.) Then, click **OK**.

Relect Groups		? ×
Look in: B NTENG.NCS.BBNPLANET.COM		-
Name	In Folder	
EH082C1850 Browsers	NTENG.NCS.BBNPLANET.com/Users	
🚮 Schema Admins	NTENG.NCS.BBNPLANET.com/Users	
🔣 Enterprise Admins	NTENG.NCS.BBNPLANET.com/Users	
🔣 🕵 Customer Managed	NTENG.NCS.BBNPLANET.com/Users	
🔣 CoManaged	NTENG.NCS.BBNPLANET.com/Users	
Service Accounts	NTENG.NCS.BBNPLANET.com/Users	
		_
Add Check Names		
Service Accounts		
	ОК	Cancel

9. As shown below under the **Member Of** tab of the **Cluster Group Properties** window, observe that the **Cluster Group** (*Genuity* Cluster Group) is a member of only the **Service Accounts** group. Then, click **OK**.

	rs Member Of Managed By	
Member of: Name	Active Directory Folder	
Service Accou	nts NTENG.NCS.BBNPLANET.cc	m/Users
······		
A <u>d</u> d	<u>R</u> emove	
This list displays	<u>Hemove</u> only groups from the local domain ani ins in the forest.	d universal groups
This list displays	only groups from the local domain and	d universal groups
This list displays	only groups from the local domain and	d universal groups

- **NOTE** The following steps create a GPO at the OU level to contain the security policy settings that will be applied locally to each cluster node. This will ensure that the local computer **User Rights Assignments** settings are correctly modified to assign proper permissions to the **clusteradmin** (*Genuity* clusteradmin) account.
- Right-click the customer OU (*Genuity*), then click **Properties**. Under the **Group Policy** tab of the Genuity Properties window shown below, click New. Name the policy Cluster Group

(Genuity Cluster Group), then click Edit to modify the GPO.

shorar manage	ed By Group Po	licy		
Curr	ent Group Policy	Object Links for (Genuity	
Group Policy C)bject Links		No Override	Disabled
Cluster Grou		elles les controls en la te	la na marci a sino s	
POUR POINT OF THE RECORD RECEIPTING	ijects higher in the 1 from: eh072c185			COM
N	Add	<u>E</u> dit		
<u>N</u> ew	11 <u>11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 </u>			Uр

11. When the **Group Policy** window shown below opens, in the left-hand pane, click **Windows Settings** beneath **Computer Configuration**. Then, click **Security Settings**, **Local Policies**, and finally **User Rights Assignment**. This is a machine policy that applies to any user who logs into the machine, although due to policy object settings, it will only make a difference to the user in the **Cluster Group** (*Genuity* Cluster Group).

Action View $] \leftarrow \rightarrow]$	× 💀 😫	
ree ster Group [eh072c1850.NTENG.NC5	Policy	Computer Setting V MTENG\Enterprise Admins,NTENG\Domain Admins,NTENG\C
Computer Configuration Software Settings Windows Settings Scripts (Startup/Shutdown)	WAct as part of the operating s Back up files and directories Increase quotas Increase scheduling priority	NTENG\Cluster Group NTENG\Cluster Group NTENG\Cluster Group NTENG\Cluster Group
Gecurity Settings Gecurity Settings	認Lock pages in memory 認Log on as a service 認Restore files and directories 認Access this computer from th	NTENG\Cluster Group NTENG\Cluster Group NTENG\Cluster Group Not defined
Geurity Options Geurity Options Geurity Options Geurity Options Geurity Options Geurity Options	Add workstations to domain Bypass traverse checking Change the system time Create a pagefile	Not defined Not defined Not defined Not defined
	Ref Create a token object Ref Create permanent shared obj Ref Debug programs Ref Debug programs Ref Denv access to this computer	Not defined

12. To edit a policy setting, right-click on the policy setting to be modified (in the right-hand pane of the Group Policy window shown in step 11), and select Security. This opens the Security Policy Setting window, as shown below. Click the Define these policy settings checkbox, then click the Add button. This opens another window containing names of various cluster groups, and a Browse button. In this window, click the Browse button, and select the newly-created (*Genuity*) Cluster Group. Then, click OK in the Security Policy Setting window shown below. Note that the term Cluster Group appears in the display field, preceded by hosting domain designation NTENG. Thus, in the window below, the display field is NTENG\Cluster Group.

Security Policy Setting	? X
Act as part of the operating sys	em
Define these policy settings: NTENG\Cluster Group	
Add <u>R</u> emove	
	OK Cancel

- 13. Perform step 12 above to edit the policy setting for each of the following user rights:
 - Load and unload device drivers
 - Act as part of the operating system
 - Back up files and directories
 - o Increase quotas
 - Increase scheduling priority
 - Lock pages in memory
 - Log on as a service
 - Restore files and directories

In the right-hand pane of the **Group Policy** window shown in step 11, each of the above user rights must contain the term **Cluster Group**, preceded by the hosting (**NTENG**) domain designation. In the case of **Load and unload device drivers**, the following two groups must also be specified:

- o Enterprise admins
- o Domain admins

NOTE The Security Policy Setting window shown in step 12 is an example of what policy settings should look like for all user rights explicitly defined, with the exception of Load and unload device drivers.

- 14. When all user rights listed in step 13 have been defined, close the **Group Policy** window shown in step 11, and then click **OK** in the **Security Policy Setting** window shown in step 12.
- 15. If logged into the domain controller, log off at this time.

- **NOTE** The following two steps are to be performed locally on each cluster node. Log on to each node individually to perform these steps.
- 16. Open the directory C:\winnt\system32\group_policy. Set the Permissions on the gpt.ini file by right-clicking on the file, select Properties, and then go to the Security tab. Click Add, select Service Accounts, then click OK. Set the Permissions for the Service Accounts group to explicitly deny Read & Execute, and Read access, as shown below. Then, click OK.

	T\ <mark>system32\GroupPolicy</mark> : <u>Vi</u> ew F <u>a</u> vorites <u>T</u> ools <u>H</u> elp
Gack	- 🔿 - 🗈 🛛 🔞 Search 🖓 Folders 🛛 History 🛛 🕾 🗙 🕫 🥅 -
Address	C:\WINNT\system32\GroupPolicy
Aachine User gpt.ini	gpt.ini Properties ? × General Security Name Add Ø Authenticated Users Bemove Ø Domain Admins (NTENG\Domain Admins) Bemove Ø Enterprise Admins (NTENG\Enterprise Ad Service Accounts (NTENG\Service Acco Ø SYSTEM System
	Permissions: Allow Deny Full Control Modify Read & Execute Read Write
Type: Config	Advanced Allow inheritable permissions from parent to propagate to this object OK Cancel Apply 9 KB

17. Finally, refresh the local machine policy on the cluster nodes by opening a command prompt and typing the following:

C:\> secedit /refreshpolicy machine_policy /enforce

This completes creation of the Cluster Group GPO. Proceed to Chapter 5, Node 1 (Primary Node) Configuation.

5 Node 1 (Primary Node) Configuration

Introduction

This chapter contains the step-by-step procedure for configuration of node 1, the primary node, of the VA 7100/7400 disk array in a dual-path cluster configuration.

Preliminary Operations

The following preliminary operations must be successfully completed before beginning the node 1 configuration procedure.

- 1. Ensure that all requirements detailed in chapters 2 through 4 have been thoroughly reviewed and successfully completed.
- 2. Ensure that configuration of the internal and external arrays has been completed.

Configuration Procedure

To configure node 1 of the cluster, proceed as follows:

- 1. Reboot node 1.
- Configuration screen of the dedicated Ethernet interconnect (crossover or heartbeat) NIC for node 1 is shown below. Enter only the IP address and Subnet mask values. For node 1 TCP/IP values, set IP address to 10.0.0.1 and Subnet mask to 255.0.0.0. Leave all other fields empty.

e appropriate IP settings.	
C Obtain an IP address auto	omatically
 Use the following IP address 	ess:
<u>I</u> P address:	10.0.0.1
S <u>u</u> bnet mask:	255.0.0.0
<u>D</u> efault gateway:	
O <u>b</u> tain DNS server addre:	ss automatically
Use the following DNS se	erver addresses:
Preferred DNS server:	<u> </u>
Alternate DNS server:	

3. Open the **Run** window as shown below by clicking the desktop **Start** -> **Run**. In the Open text box of the **Run** window, enter **diskmgmt.msc**. Then, click **OK**.

Run	Run	<u>?×</u>
Shut Down	Type the name of a program Internet resource, and Wind	
🏦 Start 🛛 🗐 🏉 🙆	Open: diskmgmt.msc	•
	ОК	Cancel <u>B</u> rowse

- 4. The Write Signature and Upgrade Disk Wizard welcome window appears. Click Next.
- 5. The Select Disk to Write Signature window appears. Check all the disks, then click Next, as shown below.

Select Disk to Write Signatur Choose the disks on which yo		
n Challanan da an dàchar ann an bhallanan a		
Select the disks on which you	want to write a signature:	
Disk 1	want townite a signature:	
\square	want to write a signature:	
Disk 1 Disk 2	want to <mark>(write a signature:)</mark>	

CAUTION It is very important not to upgrade disks because the cluster can only use *basic* disks, not *dynamic* disks.

6. The Select Disks to Upgrade window appears. Uncheck all the disks, then click Next, as shown below.

Write Signature and Upgrade Disk Wizard		×
Select Disks to Upgrade Choose the disks to be upgraded.		
Select the disks you want to upgrade:		
Disk 2	< <u>B</u> ack	Next > Cancel

- 7. The Completing the Write Signature and Upgrade Disk Wizard window appears. Click Finish.
- 8. The **Disk Manager** window appears, as shown below. Determine those disks that are basic and unpartitioned (or unallocated). These disks are labeled **Unknown** and are black in color. In the **Disk Manager** window example shown below, the basic, unallocated disks are **Disk 3** and **Disk 6**.

CBDisk 0 Basic 33.90 GB Online	HP_UTILITY 39 MB FAT Healthy (EISA Configuration) (C:) (33.87 GB NTF5 Healthy (System)
Contemposity (Contemposity) (Contemp	49.99 GB Unallocated
Conline	
Cisk 6 Unknown 494 MB Online	494 MB Unallocated
CDRom 0 CDRom (D:) 405 MB Online	W2AFPP_EN (D:) 405 MB CDFS Healthy

9. In the Disk Manager window of step 8, right-click on one of the **Unknown** disks (**Disk 3**, in this example), and the **Write Signature Disk Manager** window appears as shown below.

Contraction Contractico Contra	HP_UTILITY 39 MB FAT Healthy (EISA Configuratio	(C.) 33.87 GB NTFS Healthy (System)
Disk 3 Basic 49.99 GB Online	49.99 GB Unallocated	
Conline		
Cisk 6 Basic 494 MB Online	494 MB Unallocated	
CDRom 0 CDRom (D:) 405 MB Online	W2AFPP_EN (D:) 405 MB CDFS Healthy	

- 10. Right-click in the space labeled **Unallocated** on **Disk 3**. Select **Create Partition**. Then, click **Next** when the **Create Partition Wizard** window appears.
- 11. In the **Select Partition Type** window that appears as shown below, select **Primary partition** (the default), then click **Next**.

Select Partition Type You can specify what type of partitic	on to create.
Select the type of partition you want	to create:
Primary partition	
© Extended partition	
C Logical drive	
_ Description	ĭ
Windows 2000 and other operati	u create using free space on a basic disk. ng systems can start from a primary partition. y partitions on a basic disk, or you can make tended partition.
	< <u>B</u> ack <u>N</u> ext > Cancel

12. In the **Specify Partition Size** window that appears as shown below, enter the desired partition size in the **Amount of disk space to use:** text box (1024, minimum), then click **Next**.

How big do you want the partition	to be?	100h
Choose a partition size that is sma	iller than the maximum disk space.	
Maximum disk space:	17344 MB	
Minimum disk space:	7 MB	
Amount of disk space to use:	17344	МВ

13. In the Assign Drive Letter or Path window that appears as shown below, select Assign a drive letter: (the default) and D: from the associated pull-down menu. Then, click Next.

NOTE	If D : is assigned to another drive or partition, the other drive or partition must be assigned an
	alternate.

• Assign a drive letter: D: 🔻			
Mount this volume at an empty folder that sup	oports drive pa Browse	1	
Do not assign a drive letter or drive path			

- 14. In the **Format Partition** window that appears as shown below, select **Format this partition with the following settings:** (the default). Ensure that the following settings are entered in the Formatting frame, then click **Next**.
 - File system to use: NTFS
 - Allocation unit size: Default
 - o Volume label: Content
 - Perform a Quick Format is checked.

Specif	y whether you want to forr	mat this partition	
	Do not format this partition		
	Format this partition with t		
	Formatting Eile system to use: Allocation unit size: Yolume label: Perform a Quick Fo	NTFS Default Content ormat Enable file and folder compression	i.

15. In the **Completing the Create Partition Wizard** window that appears as shown below, review the entered selections to verify accuracy. If required, click **Back** and make corrections as necessary. Then, click **Finish** to create and format the Content partition.

NOTE The formatting time will vary with the Content partition size being created.

Create Partition Wizard		×
	Completing the Create Partition Wizard You have successfully completed the Create Partition Wizard. You specified the following settings: Partition type: Primary Partition Disks Selected: Disk 1 Partition size: 17344 MB Drive letter or path: D: File System: NTFS Allocation Unit Size: Default Volume Labet: Content To close this wizard, click Finish.	
	< <u>B</u> ack Finish Cancel	

- **NOTE** The following step is necessary for configuration of the dedicated Ethernet interconnect (private) network (refer to step 2 of this procedure). Refer to Microsoft Knowledge Base article Q242430 for more information.
- 16. At this time, turn on node 2 power and strike the **Pause** key on the keyboard when the controller begins initiating. Leave node 2 in the **Pause** state.
- **NOTE** Do not perform any further node 2 operations until specifically instructed in chapter 7 because both nodes cannot simultaneously access the external storage array before cluster service has been installed, configured, and is up and running.
- 17. Continue with node 1 configuration by proceeding to Chapter 6, Cluster Setup.

6 Cluster Setup

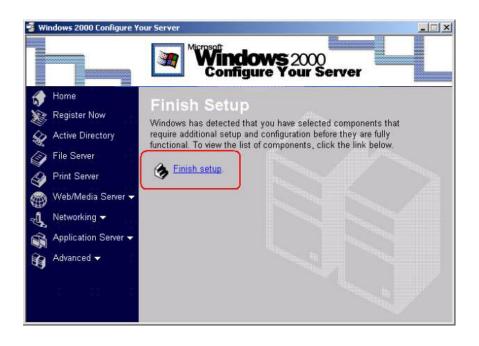
Introduction

This chapter provides detailed instructions for performing the cluster setup.

Preliminary Operations

The following preliminary operations must be successfully completed before beginning the Cluster Setup Procedure.

- 1. Ensure that all requirements detailed in chapters 2 through 5 have been thoroughly reviewed and successfully completed.
- 2. Ensure that storage array is powered up and maintained in accordance with the procedure of chapter 3.
- 3. Ensure that node 1 is powered up and running.
- 4. Ensure that node 2 is powered up but in **Pause** mode. Refer to step 16 of the Configuration Procedure of chapter 5.
- 5. Ensure that the cluster Configuration Worksheet located in Appendix A has been completely filled out.
- 6. On the node 1 Windows 2000 Configure Your Server window shown below, click Finish setup.



Cluster Setup Procedure

To perform the cluster setup procedure, proceed as follows:

1. In the Add/Remove Programs window shown below, click button labeled Configure to configure cluster service.

🙀 Add/Remov	ve Programs	
Change or Remove Programs	Add or remove Windows components To add or remove a Windows component, such as Internet Information Services (IIS), click Components. Set up services:	Components
Add New Programs Add/Remove Windows Components	Sconfigure Cluster service Click Configure to complete Setup for this component. It cannot run until you have supplied all the necessary information.	Configure
		Close

- 2. The Cluster Service Configuration Wizard Welcome window appears. Click Next.
- 3. In the Hardware Configuration window shown below, click I Understand to activate the Next button. Then, click Next.

Hardware Configuration				
Your hardware configuratio	n must be tested for	compatability with	the Cluster service	
Microsoft does not support category of the Hardware C			se listed in the Clu	ster
http://www.microsoft.com/	hwtest/hcl			
To indicate that you unders that are not listed in the Clu				ions
			[<u>TU</u> ndersta	nd
				S.

4. In the Create or Join a Cluster window shown below, select The first node in the cluster, then click Next.

reate or Join a Cluster
You can create a new cluster, or you can join an existing one.
 This server is:
The first node in the cluster. If this server is the first node in a cluster, you are creating a new cluster.
C The second or next node in the cluster. If at least one other node already exists, you are joining an existing cluster.
The first node in the cluster. If this server is the first node in a cluster, you are creating a new cluster. The second or next node in the cluster.

5. In the Cluster Name window shown below, type the cluster name CLUS2, then click Next.

Cluster Name			
You must name the new cluster.			
<u>I</u> ype a name for the new cluster:	7		
CLUS2			
	_	<u> </u>	1

6. In the Select an Account window shown below, enter cluster in the User name: field and the applicable password in the Password: field for the specified domain. Then, click Next.

lect an Acco	
For security pu	urposes, the Cluster service must use a domain account.
Tupe the user	name and password for the domain account you want the Cluster service
	ccount is given special security privileges on each cluster node.
	cluster
liser name:	
<u>U</u> ser name:	
<u>U</u> ser name: <u>P</u> assword:	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

7. In the Add or Remove Managed Disks window shown below, select the disk array to be used for this cluster. Select disks in the Unmanaged disks: field, and click Add to transfer them to the Managed disks: field. After all the desired disks have been added to the Managed disks: field, click Next.

Add the disks that you want the cluster to manage. Remove those disks want the cluster to manage.	that you do not
Inmanaged disks: Managed disks:	
Add ->	A) A6189A EX22)

8. In the Cluster File Storage window shown below, select disk Q: (Quorum) as the disk to store cluster files. Then, click Next.

You store cluster checkpoint and log files on a clus cluster Select a disk on which to store cluster checkpoint Select a disk or partition with at least 5 MB of free s	and log files.
Select a disk or partition with at least 5 MB of free s	-
	(100 LID
also recommended that you keep the cluster check partition from user applications. Disks:	space [100 MB recommended]. It is (point and log files on a separate
Q: (Quorum)	-
D: (Content) L: (Log) D: (Duorum)	

9. In the Configure Cluster Network dialog box shown below, click Next.

Cluster Service Configuration Wizard	×
Configure Cluster Networks	
It is recommended that you use more than one private network for cluster communications. Using only one network creates a single point of failure.	
Cluster service can use private networks for cluster status signals and cluster management. This provides more security than using a public network.	
If you prefer, you can use a public network for cluster management, or you can use a mixed network for both private and public communications.	
Make sure you don't select a public network for private communications or a private network for public communications. Either selection prevents other computers from joining the cluster.	
To continue setting up your cluster, click Next.	
< <u>Back</u>	cel

10. In the Network Connections window for the public access NIC shown below, verify that the Network name (Local Area Connection, in this case) is correct, check the Enable this network for cluster use box, and click the All communications (mixed network) button. Then, click Next.

Network name:	Local Area Connection
Device:	HP NetServer 10/100TX PCI LAN Adapter
IP address:	15.18.116.181
Enable this	network for cluster use
-	performs the following role in the cluster: cess only (public network)
 Internal cl 	luster communications only (private network)
_	luster communications only (private network) unications (mixed network)

11. In the **Network Connections** window for the dedicated Ethernet internal connection shown below, verify that the **Network name (private network, in this case) is correct, check the Enable this network for cluster use** box, and click the **Internal cluster communications only (private network)** button. Then, click **Next**.

Type the network private or mixed ne	name, and specify whether this network will perform as a public, stwork.	
Network name:	private network	
Device:	D-Link DFE-530TX+ PCI Adapter	
IP address:	10.0.0.2	
This network p C Client acce Internal clu	etwork for cluster use erforms the following role in the cluster: ss only (public network) ster communications only (private network) ications (mixed network)	

12. In the **Internal Cluster Communication** window shown below, ensure that **Private** (internal cluster communication NIC) is positioned above the **Local Area Connection 2** (public access) in the Networks field. If adjustment of the order is required, select one entry, then click **Up** or **Down** button, as required. Then, click **Next**.

Specify the within the c	er Communicatior priority in which the a luster.	⁷ and a set of the	s should be use	d for communical	ion
(private net networks in	ng list displays the ne works). Position the p descending order of name in the list, selec	primary network fi f importance.	rst, and then po	sition additional	1
Private Local Area	Connection 2			<u>U</u> p Dowr	

13. In the Cluster IP Address window shown below, enter 15.18.116.215 in the IP address field, and repeat verification of the public access NIC as performed in step 10. Then, click Next.

uster IP Address The IP address ide	entifies the cluster to the network.	
Type the IP addre automatically.	ss for management of the cluster. The subnet mask may be s	upplied
IP address:	15 . 18 . 116 . 215	
Subnet mask:	255 . 255 . 248 . 0	
Select the public r	network from which clients gain access to the cluster.	
Network:	Local Area Connection	-

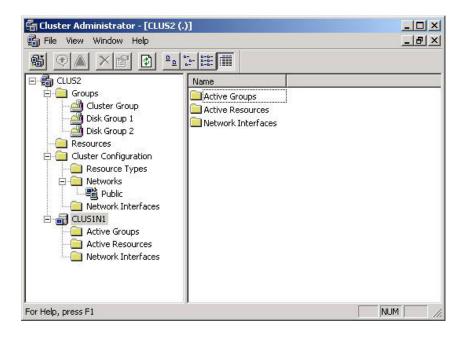
14. In the **Completing the Cluster Service Configuration Wizard** window shown below, click **Finish** to complete the cluster node 1 configuration.

Cluster Service Configura	ation Wizard	×
	Completing the Cluster Service Configuration Wizard	
	You have successfully completed the Cluster Service Configuration wizard.	
	To complete the configuration, click Finish.	
	< <u>B</u> ack Finish Cano	:el

15. The message shown below appears to indicate that cluster service has started.



16. Open the Cluster Administrator window as shown below by clicking the desktop Start -> Programs -> Administrative Tools -> Cluster Administrator. Verify that cluster node 1 has started and is running correctly.



17. With node 1 up and running, configuration of node 2 can be performed. Proceed to chapter 7.

7 Node 2 (Secondary/Passive Node) Configuration

Introduction

This chapter contains the step-by-step procedure for configuration of node 2, the secondary/passive node, of the VA 7100/7400 disk array in a dual-path cluster configuration.

Preliminary Operations

The following preliminary operations must be successfully completed before beginning the cluster setup procedure.

- 1. Ensure that all requirements detailed in chapters 2 through 6 have been thoroughly reviewed and successfully completed.
- 2. Ensure that storage array is powered up and maintained in accordance with the procedure of chapter 5.
- 3. Ensure that node 1 is powered up and running.
- 4. Remove node 2 from the Pause state, and allow node 2 to finish its booting.

Configuration Procedure

Perform the following procedure to configure node 2, the secondary or passive node.

- 1. Repeat the setup process of node 1 to set up node 2; that is, repeat the procedure of chapter 5. Check for detection of any dynamic drives and change them to basic as performed in steps 4 through 7 of chapter 5. This time, there is no need to pause any server, as was done with node 2 at the end of chapter 5. Ensure that the drive letters are identical on both nodes (refer to step 13 of chapter 5).
- 2. Repeat the procedures of chapter 6 for node 2 up through step 3 of the Cluster Setup Procedure.
- 3. In the Create or Join a Cluster window shown below, select The second or next node in the cluster, then click Next.

ster Service Configuration Wizard	
Create or Join a Cluster	
You can create a new cluster, or you can join an existing one.	
This server is:	
C The first node in the cluster. If this server is the first node in a cluster, you are creating a r	new cluster.

4. In the **Cluster Name** window shown below, type **CLUS2** in the cluster name field. Then, enter **cluster** in the **User name**: field and the applicable password in the **Password**: field for the specified domain. Check the entry in the **Domain**: field. All entries on the window shown below must be identical to the entries in steps 5 and 6 of the Cluster Setup Procedure of chapter 6. Then, click **Next**.

uster Name			
To join a cluste	er, you must provide the cluster r	name.	
Type the name	of the cluster you want to join:		
CLUS2			
Connect to	cluster as:	J	
User name:	cluster		
Les es			
Password:	1		
And the second	NCSWH	<u> </u>	
<u>D</u> omain:			
<u>D</u> omain:	<u>.</u>	< Back Next >	Canc

5. In the **Select an Account** window shown below, enter the applicable password in the **Password:** field again. Then, click **Next.**

elect an Acco		ce must use a domain acc	oupt	
r or security pr	aposes, the cluster servic	se musi use a domain acc	Journ.	
		he domain account you v		vice
to use. This a	count is given special se	ecurity privileges on each	cluster node.	
User name:	cluster			
Password:	******			-1
	NCSWH			-
Domain:	111000 33313			2011

6. In the **Completing the Cluster Service Configuration Wizard** window shown below, click **Finish** to complete the cluster node 2 configuration.

Cluster Service Configur	ation Wizard	×
	Completing the Cluster Service Configuration Wizard	
	You have successfully completed the Cluster Service Configuration wizard.	
	To complete the configuration, click Finish.	
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 Open the Cluster Administrator window as shown below by clicking the desktop Start -> Programs ->
 Administrative Tools -> Cluster Administrator. Verify that both cluster nodes 1 and 2 have started and are
 running correctly. At this point, cluster setup and installation are complete and ready for installation of a cluster
 resource application such as Microsoft SQL Server 2000 Enterprise Edition.

Cluster Administrator - [CLU5	2.01			12.10		<u>- ×</u>
j Ele View Window Help						_ @ ×
5 • A X 🖻 🗗 📍	15/80					
🖏 CLUS2	Name	State	Owner	Group	Resource Type	Descriptio
Groups Groups Groups Cluster Configuration Gotter Configuration Active Groups Active Groups CUSSN2 CUSSN2 CUSSN2 Active Resources Network Interfaces	UD Disk D: UD Disk L: Sul Cluster IP Address Sul Cluster Name UD Disk Q:	Online Online Pending Online Pending Online Online	CLUSSAR2 CLUSSAR2 CLUSSAR2 CLUSSAR2 CLUSSAR2 CLUSSAR2	Diek Group 2 Diek Group 1 Cluster Group Cluster Group Cluster Group	Physical Disk Physical Disk IP Address Network Name Physical Disk	,

A Configuration Worksheet

Manual Configuration Worksheet

This sheet should be filled out completely before beginning the provisioning process. Specific documents referencing appropriate servers, DNS entries, etc. should be available for each data center. If your data center does not have one, generate one from this base and make it available to all administrators.

		Node 1		Node 2				
1	Organizational Unit (OU)			JI				
2	Computer Name							
3	Cluster Name							
4	Cluster Account / (Password)							
5	Cluster IP Address							
6	Cluster Subnet Mask							
7	Windows 2000 Domain Name							
Items 8 - 14 Refer to the Front-End (Public) Network Adapter								
8	Front-End IP Address							
9	Front-End Subnet Mask							
10	Front-End Default Gateway							
11	Front-End Primary DNS							
12	Front-End Secondary DNS							
13	Front-End Duplex Mode	Half	Full	Half	Full			
14	Front-End Media Type	10	100 (Mbps)	10	100 (Mbps)			
Item	Items 15 – 16 Refer to the Crossover (Private) Network Adapter							
15	Private IP Address 10.0.0.1			10.0.0.2				
16	Private Subnet Mask 25		255.0.0.0		255.0.0.0			
Items 17 - 20 Refer to the Back-End Network Adapter								
17	Back-End IP Address							
18	Back-End Subnet Mask							
19	Back-End Duplex Mode	Half	Full	Half	Full			
20	Back-End Media Type	10	100 (Mbps)	10	100 (Mbps)			